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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/563,095

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Gerhard Flores

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DREISS, FUHLENDORF, STEIMLE & BECKER  
POSTFACH 10 37 62  
D-70032 STUTTGART,  
GERMANY

EXAMINER

BROWN, PHYLLIS M

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/563,095	<b>Applicant(s)</b> FLORES ET AL.	
	<b>Examiner</b> MACADE BROWN	<b>Art Unit</b> 3753	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 December 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 23-44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 23-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/30/05</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This office action is responsive to the amendment filed on 12/30/05. Claims 23-44 are presently pending in this application. As directed by the amendment: claims 1-22 have been cancelled, and no new claims have been added.

#### ***Claim Objections***

Claim 34 is objected to because of the following informalities: Claim 34 should recite “shaped by a honing process,” see line 3. Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 44 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 44, it is unclear what is meant by the recitation “whose surface...” see line 4. It is best understood that the claim should recite “the surface...”

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 23 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Watkins et al. (6,105,610).**

Regarding claims 23 and 29, Watkins teaches a valve closing member 16 (fig. 3), a valve seat 22 having a bore hole 20 for a medium to be controlled, a surface of the valve seat having a plurality of concentrically extending channels and elevated structures 24, 26, 30 disposed between the channels, wherein a roughness of the valve seat surface, defined by the channels and the elevated structures 24, 26, 30, being larger than a roughness of a surface of the valve closing member 16, wherein peaks of the elevated structures (surfaces of the elevations which abut ball ) are elastically deformed when the valve is closed, to define a plurality of concentrically extending sealing surfaces; the valve closing member 16 being a ball.

**Claims 23 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Hinsch (1,560,235).**

Regarding claims 23 and 30, Hinsch teaches a valve closing member 5 (fig. 4), a valve seat having a bore hole for a medium to be controlled, a surface of the valve seat having a plurality of concentrically extending channels 16 and elevated structures 17 disposed between the channels 16, wherein a roughness of the valve seat surface, defined by the channels and the elevated structures being larger than a roughness of a surface of the valve closing member 5, wherein peaks of the elevated structures (surfaces of the elevations which abut seat) are elastically deformed when the valve is closed, to define a plurality of concentrically extending sealing surfaces; the closing member 5 having a flat sealing surface.

**Claims 23, 24, 26, 27, 29, 33, 34, 37, 41-43 are rejected under 35**

**U.S.C. 102(b) as being anticipated by Becker (6,173,494).**

Regarding claims 23, 24, 26, 27, 29, 33, 34, 37, 41-43, Becker teaches a valve closing member 1 (fig. 1), a valve seat 3 having a bore hole for a medium to be controlled, a surface of the valve seat having a plurality of concentrically extending channels and elevated structures disposed between the channels (Becker teaches a surface roughness remaining after grinding, the remaining surface roughness forms channels within the seat; fig. 2), wherein a roughness of the valve seat surface, defined by the channels and the elevated structures being larger than a roughness of a surface of the valve closing member 1, wherein peaks of the elevated structures (surfaces of the elevations which abut seat) are elastically deformed when the valve is closed, to define a plurality of concentrically extending sealing surfaces; the roughness of the valve seat surface being less than 8 micro-meters; the valve seat surface including a tapered, conical form; the channels and the elevated structures on the valve seat surface being produced by honing without advance parallel to the valve seat surface; the valve closing member 1 being a ball.

Additionally, method steps including finishing the surface with a honing process using a tool 6, 7 (fig. 4) having a tool head cooperating with the valve seating surface, the tool 6, 7 being driven to rotate and produce concentrically extending working channels on the valve seating surface by means of cutting grit disposed on the tool head (tool member being a grinding stone), wherein an amount by which the cutting grit protrudes from a surface of the tool head is defined to produce the working channels on

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the valve seating surface, the working channels having a depth which is sufficiently large to permit elastic deformation of elevated structures disposed between the channels in response to seating of a valve closing member on the valve seating surface, thereby forming a plurality of narrow, concentric sealing surfaces; the valve seat 3 has a nominal conical shape initially effected in pre-finish processing steps and, in a finishing step, the valve seat being conically shaped; the honing process being carried out using a tool 6, 7 having a tool head filling, and with means (unreferenced port) for introducing cooling and lubricating materials, the tool being driven to rotate and, by means of cutting grit located on the tool head, produce processing channels which are disposed concentrically about the conical shape on the valve seating surface, a protrusion of grains on the tool head being dimensioned in such a fashion that a peak to valley depth of the channels is sufficiently large to permit elastic deformation of elevated structures between the channels to compensate for tolerances in roundness; the tool 6, 7 being periodically removed from working engagement and a processing location being subjected to flow of a cooling and lubricating medium; the tool 7,6 being deflected during the honing process by means of a bending joint fashioned in its shaft to compensate for misalignment of a longitudinal axis of the valve seat (the insert 7 being flexible and allows radial movement); the bending joint being effected through lubrication of a tool shaft, a deflection being effected through elastic deformation of the bending joint; the tool 6, 7 and a work piece are driven in opposite directions during honing.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 25 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Becker (6,173,494).**

Regarding claims 25 and 38, Becker teaches essentially all claimed features, but fails to disclose the roughness of the valve being approximately 1 micro-meter; during honing, the tool rotates at a rate of 250 to 6000 revolutions per minute.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ in Becker the roughness of the valve being approximately 1 micro-meter; the tool rotates at a rate of 250 to 6000 revolutions per minute, since it has been held that where the general conditions of a claim are disclosed

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in the prior art, **discovering the optimum or workable ranges** involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

**Claims 28, 31, 35, 36, 39, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Becker (6,173,494) in view of Miyaki (Japan 59-182055).**

Regarding claims 28, 31, 35, 36, 39, and 40, Becker teaches essentially all claimed features, but fails to disclose a surface of the honing tool covering an entire portion of the valve seat surface coming in contact with the valve closing member when the valve is closed; a precision of roundness of the elevated structures being less than or equal to 2.0 micro-meters; subsequent to honing, a grit removal process is carried out or a grit removal process is carried out using diamond tipped tools and/or brushes having cutting grit; the honing being carried out in at least two sequential operations, a roughness profile of a previous honing operation being abrasively removed using a tool having a finer cutting grit.

Miyaki teaches a during honing, a surface of a honing tool 4 (fig. 2) covers an entire portion of the valve seat surface 2 coming in contact with the valve closing member, when the valve is closed; precision of roundness of the elevated structures being less than or equal to 2.0 micro-meters; subsequent to honing, a grit removal process being carried out (Becker teaches a rough grinding, followed by fine grinding, it is well known in the art to remove grit various steps of the initial honing process); the honing being carried out in at least two sequential operations, a roughness profile of a previous honing operation being abrasively removed using a tool having a finer cutting grit, to yield improved roundness of a surface (pg. 2).

It would have been obvious to one of ordinary skill in the art, at the time of invention, to employ in Becker a tool covering an entire portion of the valve seat surface; a surface of a honing tool covering an entire portion of the valve seat surface; precision of roundness of the elevated structures being less than or equal to 2.0 micrometers; subsequent to honing, a grit removal process being carried out; the honing being carried out in at least two sequential operations, a roughness profile of a previous honing operation being abrasively removed using a tool having a finer cutting grit, as taught by Miyaki, for the purpose of improving roundness of a surface.

**Claim 44, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Becker (6,173,494) in view of Ishizaki (6,755,720), further in view of Pedersen et al. (5,241,794).**

Regarding claim 44, Becker teaches essentially all claimed features, but fails to disclose the tool having a plurality of layers being utilized with which a cutting grit is ceramically bonded, wherein the tool is dressed by a flat dressing wheel with respect to the surface, the tool being tilted through an angle in correspondence with a desired conical shape of the work piece, wherein the tool and the dressing wheel are driven in opposite directions during dressing of the tool.

Ishizaki teaches a tool having a plurality of layers being utilized with which a cutting grit is ceramically bonded, so that each grain is bonded at an increased area of a surface, preventing removal of the abrasive grains from the bond layer or support body, and improving strength and toughness(col. 4, lines 51-56).

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It would have been obvious to one of ordinary skill in the art, at the time of invention to employ in Becker a tool having a plurality of layers being utilized with which a cutting grit is ceramically bonded, as taught by Ishizaki, for the purpose of bonding an increased area of a surface, preventing removal of the abrasive grains from the bond layer or support body, and improving strength and toughness.

Pederson teaches the tool 12 (fig. 4) being dressed by a flat dressing wheel 2 with respect to the surface, the tool 12 is tilted through an angle in correspondence with a desired shape of the work piece, wherein the tool 12 and the dressing wheel 2 are driven in opposite directions during dressing of the tool, to generate a desired cutting surface.

It would have been obvious, to one of ordinary skill in the art, at the time of invention, to employ in Becker a tool dressed by a flat dressing wheel, as taught by Pederson, for the purpose of resharpening the same tool in readiness for a cutting operation.

**Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hinsch (1,560,235).**

Regarding claim 32, Hinsch teaches essentially all claimed features, but fails to disclose the tolerance in a precision of flatness of the elevated structure being less than 4 micro-meters.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ in Hinsch a tolerance less than 4 micro-meters , since it has been held that where the general conditions of a claim are disclosed in the prior art,

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**discovering the optimum or workable ranges** involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MACADE BROWN whose telephone number is (571)270-5428. The examiner can normally be reached on 10-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Hepperle can be reached on 571-272-4913. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MACADE BROWN/  
Examiner, Art Unit 3753

/John Rivell/  
Primary Examiner, Art Unit 3753